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A Preliminary Summary of Available Data on Nutrients, Primary Productivity, and Chlorophyll α for the ICNAF Larval Herring Research Area, 1975-1978

by

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The Northeast Fisheries Center has coordinated the collection of data on chlorophyll-a, primary productivity, and nutrients on Georges Bank since 1975. In 1975 and 1976 the samples were collected by several countries on ICNAF larval herring surveys. Starting in 1977 the samples were taken by US and USSR vessels on MARMAP or Ocean Pulse cruises. This paper provides a summary of the data collected and methods used in acquiring and processing the samples (Table 1). Some of the data has been presented in Cohen and Wright (1979) and O'Reilly and Busch (1979). Inquiries about the 1975-76 data should be sent to E. Cohen, NEFC Woods Hole, Massachusetts, about 77-78 data should be sent to J. E. O'Reilly, NEFC Sandy Hook, New Jersey.

Methods - Larval Herring Cruises

All water samples were collected with either teflon lined Nansen or PVC Niskin bottles. Chlorophyll samples were taken at standard depths of 0, 10, 20, 50, 75, and 100 meters. One hundred milliliter samples were filtered through Gelman A/E glass fiber filters. The filters were stored frozen over desiccant until they were analyzed by standard fluorometric techniques (Strickland and Parsons 1972). Nutrient samples were taken at 0, 10, 20, 50, 75, 100, 125, 150, 175, and 200 meters in water $\leq$200 m, in deeper water the depths were 0, 10, 20, 50, 75, 100, 200, and 300 m. Nutrient determinations were done using standard oceanographic techniques for auto-analyzers (Strickland and Parsons 1972). Samples for primary production measurements were taken at 100%, 50%, 25%, 10%, and 1% light depths. The actual depths for the different light levels were based on either a Secchi disk observation or on direct measurements using a Lambda submarine photometer. Productivity was deter-

mined using the ^{14}C technique developed by Steeman-Nielsen and modified by Stickland and Parsons (1972). The samples were placed in a simulated in situ incubator on deck and cooled with running (surface) seawater. Neutral density filters were used to obtain the appropriate light levels. Incubations were approximately 4 hours starting in the morning and running until after noon.

Methods - MARMAP and Ocean Pulse Cruises

The methods used for ^{14}C productivity and chlorophyll sampling on these cruises are described in detail in O'Reilly and Thomas (1979) and Evans and O'Reilly (1980), respectively. The major difference compared to the larval herring cruises is that the chlorophyll and primary productivity samples were fractionated into nanoplankton (<20μ), net plankton (>20μ), and extracellular release. Slighly different light depths were also used: 100%, 69%, 46%, 25%, 10%, and 1%. The depths of collection for chlorophyll and nutrients were similar to the larval herring cruises. Chlorophyll samples were taken at 1, 5, 10, 15, 20, 25, 30, 35, 50, and 75 meters. During primary productivity stations additional samples were taken at the previously listed light depths. Nutrient samples were taken about every 10 meters in shallow water and at 0, 10, 20, 30, 50, 75, 100, 150, 200, 250 etc. in deeper water. Processing of the samples was carried out using techniques described in Strickland and Parsons (1972), O'Reilly and Thomas (1979), and Evans and O'Reilly (1980).

LITERATURE CITED

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Table 1. Cruises and samples obtained for nutrient and phytoplankton studies in the ICNAF larval herring research area for the period 1975-1978[7].

Date	Cruise	Number of stations	Total Number of Samples: Phosphate	Silicate	Nitrate	Chlorophyll	In vivo fluorescence	Primary production	Notes
24 Sept.-10 Oct. 1975	Belogorsk 75-2	90	617	617	617	205	None	None	Data report available[1]
15-31 Oct. 1975	Belogorsk 75-3	94	628	628	628	241	None	None	Data report available[1]
31 Oct.-16 Nov. 1975	Anton Dohrn 75-187	100	523	523	623	330	None	None	Data report available.
2-19 Dec. 1975	Albatross IV 75-14	83	491	491	491	195	✓	9 stations	Data report and analysis available[1,2,3]
9-25 Feb. 1976	Albatross IV 76-01	49	304	304	304	255	✓	5 stations	Data report and analysis available[1,2,3]
1-18 Oct. 1976	Annandale 76-01	80	153	153	153	153	None	None	4
13 Oct.-4 Nov. 1976	Wieczno 76-03	112	755	755	755	300	None	10 stations	4
14 Nov.-4 Dec. 1976	Anton Dohrn 76-02	137	1250	1250	1250	900	None	27 stations	4
26 Nov.-12 Dec. 1976	Researcher FRG 11-76	110	590	590	590	590	None	None	4
15 Oct.-11 Nov. 1977	Argus 77-01	142	None	None	None	1596	None	None	Data report available[1]
12-19 Nov. 1977	Mt. Mitchell 77-11	37	None	None	None	536	None	None	Data report available[1]
25 Nov.-4 Dec. 1977	Kelez 77-11	38	None	None	None	289	None	None	Data report available[1]
14 Feb.-13 Mar. 1978	Delaware II 78-02	132	None	None	None	1106	None	None	Data report available[1]
9 Aug.-5 Sept. 1978	Belogorsk 78-01	159	264	264	264	2828	None	44 stations	Data report available[1,5,6]
5 Oct.-2 Nov. 1978	Belogorsk 78-03	130	264	264	264	2327	None	42 stations	Data report available[1,5,6]
19 Sept.-9 Oct. 1978	Albatross IV 78-12	172	425	425	425	1380	None	40 stations	Data report available[1,5,6]
15-30 Nov. 1978	Belogorsk 78-04	78	148	148	148	1429	None	24 stations	Data report available[1,5,6]

[1] Nutrient, chlorophyll, and primary productivity data has been keypunched and audited, on computer cards or files.

[2] In vivo fluorescence data in strip chart and fluorometer log form.

[3] The primary productivity data has been summarized in Cohen and Wright (1979).

[4] The nutrient and chlorophyll samples from these cruises were never processed. Samples deteriorated in storage before resources became available to run them.

[5] The primary productivity data has been summarized by O'Reilly and Busch (1979).

[6] The nutrient samples were taken by Soviet scientists. The NEFC has not yet received the results.

[7] MARMAP or Ocean Pulse cruises (from Oct. 1977 on) include stations as far south as Cape Hatteras.